

CARL E. ADAMS, Jr., Ph.D., P.E.
Principal, Chief Executive Officer

EDUCATION: The University of Texas, Austin
Ph.D., Environmental Health Engineering, 1969

Vanderbilt University, Nashville, Tennessee
M.S., Sanitary and Water Resources Engineering, 1966
B.S., Civil Engineering, 1965

PROFESSIONAL
REGISTRATION: Professional Engineer: Alabama, Florida, Indiana, Kentucky, Louisiana, Mississippi,
Ohio, Tennessee, and Texas.

EXPERIENCE:

Summary: In January 1985, Dr. Adams founded The ADVENT Group, Inc. of Brentwood, Tennessee. Dr. Adams has been a consultant to more than 700 U.S. and foreign industries; author of numerous technical publications; co-author and editor of four books and several engineering manuals regarding industrial wastewater treatment design and management. Professional activities include technical seminars and courses in the United States, Eastern and Western Europe, South America, the Middle East and Australia. He also has served as a Visiting Adjunct Professor at Vanderbilt University for application of advanced wastewater technology.

1985 - Present The ADVENT Group, Inc., Brentwood, Tennessee
Principal, Chief Executive Officer

1969 - 1985 The AWARE Corporation, Nashville, Tennessee
Dr. Adams founded and held technical and management positions including Vice Chairman of the Board and President & Chief Executive Officer

1977 UNOP/WHO Project Environmental Pollution Abatement Center, Katowice, Poland
Special Consultant

1968 - 1969 Engineering Science of Texas, Austin, Texas
Project Manager

University of Texas, Austin, Texas
Research Associate

U.S. Corps of Engineers, Nashville, Tennessee
Project Engineer

PUBLICATIONS:

“Rapid Evaluation and Installation of a Low Cost Water Treatment Scheme at a Superfund Site,” with Anu Singh, *Environmental Progress*, Vol. 16, No. 4, Winter 1997.

“Carbon with a Twist: Granular Activated Carbon Reduces Toxicity at Chemical Manufacturing Facility,” with S. Butterworth, R. Falco, and A. Pedigo, *Industrial Wastewater*, pp. 42-45, Mar/Apr 1994.

“Optimizing Design for Secondary Clarifiers,” *Proc. Water Environment Federation*, Anaheim, CA, October 1993.

“Source Control for Wastewater Discharges for the Organic Chemicals Industry,” *The National Environmental Journal*, pp. 28-34, Sept/Oct 1992.

“Industrial Wastewater Treatment Options,” *the National Environmental Journal*, pp. 16-18, Sept/Oct 1991.

“Design of Activated Sludge Systems with Regard to High Salt Wastewaters,” with E.J. Reap, J.H. Koon, and W.W. Eckenfelder, Jr. *Proc. of 51st Annual Conference-Water Pollution Control Federation*, Anaheim, CA, October 1978.

“Design of Activated Sludge Systems with Regard to High Salt Wastewaters,” with W.W. Eckenfelder, Jr. *Proc of 9th IAWPR Conference*, Stockholm, Sweden, June 1978.

“Sludge Handling Methodology for Refinery Sludge,” with R.M. Stein. *Proc. Open Forum on Management of Petroleum Refinery Wastewaters*, sponsored by the Environmental Protection Agency, The American Petroleum Institute, The National Petroleum Refiners Association, and The University of Tulsa, Tulsa, OK June 1978.

“Operational Considerations for Aeration Systems,” *Proc. of 17th Annual Conference, Texas Water Pollution Control Association*, Austin, TX May 1978.

“Oxygen Activated Sludge Considerations for Industrial Applications,” with W.W. Eckenfelder, Jr. *Proc. of 70th Annual AIChE Meeting*, New York, November 1977.

“The Economics of Handling Refinery Sludges,” with J.H. Koon. *Proc. of Second Open Forum on Management of Petroleum Refinery Wastewater*. Sponsored by EPA, The National Petroleum Refiners Association and the University of Tulsa, Tulsa, October 1977.

“Treatment of Textile Dye House Wastewaters, with G.M. Davis, J.H. Koon. *Proc. 32nd Annual Purdue Industrial Waste Conference*, Purdue University, West Lafayette, IN, May 1977.

“Comprehensive Temperature Model for Aerated Biological Systems,” with Y. Argaman. *Proc. of 8th IAWPR Conference*, Sidney, Australia, October 1976.

“Wastewater Treatment Concerns of the Organic Chemicals Industry in the United States,” with Billy T. Sumner. USA-USSR Working Group of the Prevention of Water Pollution from Municipal and Industrial Sources. *Proc. of Symposium on Intensification of Biochemical Treatment of Wastewaters*, Vodgeo, Moscow, USSR, August 1976.

“Technical Preparation for Negotiating and Amending NPDES Permits,” *Proc., Legal Implications of Existing and Proposed Water Quality Control Legislation*. Sponsored by Vanderbilt University of Nashville, Tennessee and American University, Washington, D.C., June 1976.

“Startup and Initial Operational Procedures for Activated Sludge Facilities for Treatment of a Complex Wastewater.” *Proc. 31st Annual Purdue Industrial Waste Conference*, Purdue University, Purdue, May 1976.

“Sludge Handling Methodology for Refinery Sludges,” *Proc. of First Open Forum on Management of Petroleum Refinery Wastewaters*. Sponsored by EPA, The American Petroleum Institute, The National Petroleum Refiners Association, and The University of Tulsa, Tulsa, OK, January 1976.

“Design and Performance of Physical-Chemical and Activated Sludge Treatment for an Edible Oil Plant,” with R.M. Stein and Joel J. Joseph. *Proc. of 30th Ind. Waste Conference*, Purdue University, Lafayette, IN, May 1975.

“Biological Treatment for World’s Largest Acrylate Plant to Achieve BATEA of Houston Ship Channel,” with G.M. Davis, *Proc. of 30th Ind. Waste Conference*, Purdue University, Lafayette, IN May, 1975.

“Biological and Physical-Chemical Treatment of Waste from a Diversified Organic Chemicals Plant,” with J. H. Koon. *Proc. of 30th Ind Waste Conference*, Purdue University, Lafayette, IN, May 1975.

“Analysis of Alternatives in the Removal of Suspended Solids in the Pulp and Paper Industry,” with O.D. Smith and R.M. Stein, *Proc. of 1975 TAPPI Environmental Conference*, Atlanta, May 1975.

“Tertiary Ozonation of Industrial Wastewaters,” with R.M. Stein, G.M. David, and C.D. Magee (USA), *Proc. of Second International Ozone Symposium*, Montreal, Canada, May 1975.

“Achieving BATEA on the Houston Ship Channel Using Biological Treatment,” *Proc. of ASCE National Structural Engineering Convention & Exposition*, New Orleans, April 1975.

“A Kinetic Model for Design of Completely-Mixed Activated Sludge Treating Variable-Strength Industrial Wastewaters,” with W.W. Eckenfelder, Jr. and Joe C. Hovious, *Water Research*, Vol. 9, pp. 37 to 42, Pergamon Press, January 1975.

“Equalization and Biological Treatment Techniques for a High Salinity, Complex Organic Wastewater,” with W.W. Eckenfelder, Jr. and Vladimir Novotny, *Proc. of 7th IAWOR Conference*, Paris, France, September 1974.

“Treatment of a High Strength Phenolic and Ammonia Wastestream by Single and Multi-Stage Activated Sludge Processes,” *Proc. of 29th Annual Purdue Ind. Waste Conf.*, Purdue University, Lafayette, IN, May 1974.

“Physical-Chemical and Biological Treatability Investigations and Process Design for a Tall Oil Wastewater,” with F.G. Ziegler, *Proc. of the 27th Annual Purdue Industrial Waste Conference*, Purdue University, West Lafayette, IN, May 1974.

“Monitoring for Variability Control,” *Proc. of International Conference on Effluent Variability from Wastewater Treatment Processes and Its Control*, Sponsored by the International Association of Water Pollution Research, Tulane and Vanderbilt Universities, New Orleans, December 1974.

“The Effects and Removal of Heavy Metals in Biological Treatment,” with W.W. Eckenfelder, Jr., and B.L. Goodman, *Proc. of Heavy Metals in the Aquatic Environment*. Sponsored by Vanderbilt University, IAWPR and Sport Fishing Institute, December 1973.

“Planning for Industrial Wastewater Reuse in the Cleveland-Akron Area,” with J.H. Koon and W.W. Eckenfelder, Jr., *Complete Water Reuse*, 1973.

“Nitrification Design Approach for High Strength Ammonia Wastewaters,” with W.W. Eckenfelder, Jr., *Proc. of 46th WPCF Conference*, Cleveland, October 1973.

“Design Alternative for Nitrogen Removal,” *Environmental Science and Technology*, Vol 7, No.8, August 1973.

“Ozonation Procedures for Industrial Wastewaters,” with W.W. Eckenfelder, Jr. and R.M. Stein, *Proc. of First International Symposium and Exposition on Ozone for Water and Wastewater*, Washington, D.C., December 1973.

Multi-Stage Aerated Lagoon Design for a High Temperature Wastestream,; *Water and Waste Engineering*, 1972.

“Rational Design Approach for Aerated Lagoon,” with W.W. Eckenfelder, Jr. and C.D. Magee, *Proc. of 6th International Conf. on Water Pollution Research*, Jerusalem, Israel, June 1972.

“A Study of Aerobic Sludge Digestion Comparing Pure Oxygen and Air,” with R. M. Stein and W.W. Eckenfelder, Jr., *Proc. of 27th Ind. Waste Conf.*, Purdue University, Lafayette, IN, May 1972.

“Physical, Chemical, and Biological Treatment of a Latex Emulsion Wastewater,; with Vladimir Novotny, Frank Smith and W.W. Eckenfelder, Jr., *Proc. of 27th Ind. Waste Conf.*, Purdue University, Lafayette, IN, May 1972.

“Treatability and Toxicity of a Tetraethyl Lead Wastewater,” with R.M. Stein and W.W. Eckenfelder, Jr., *Proc. of Second Environmental Engineering Science Conf.*, University of Louisville, Louisville, KY, April 1972.

“Partial Volatile Solids Destruction: Aerobic Digestion,” *Environmental Engineers Handbook*, Vol I, Section 1.5.14, Pergamon Press Ltd., 1971.

“The Impact of Water Pollution on Man’s Environment,” *The Mallinckrodt Magazine*. Spring 1971.

“The Design and Economics of Joint Wastewater Treatment Facilities,” with W.W. Eckenfelder, Jr., *Proc. of National Specialty Conf.: Clean Water for Our Future Environment*, sponsored by ASCE, Los Angeles, 1971.

“Investigations into the Reduction of High Nitrogen Concentrations,” with P. Krenkel and E. Bingham, *Proc. of the 5th International Association of Water Pollution Research Conference*, San Francisco, 1970.

“Response of Activated Sludge to Organic Transient Loading,” with W.W. Eckenfelder, Jr., *J. Sanitary Engr. Div.*, ASCE, April 1970.

The Response of Activated Sludge Systems to Transient Loading Conditions, Ph.D. Dissertation, The University of Texas, Austin, January 1969.

Bioassay Methods, Procedures and Interpretations, Masters Thesis, Vanderbilt University, Nashville, August 1966.

PAPER PRESENTATIONS:

Compliance Demonstration Program For Socmi 40 CFR Part 60 Subpart YYY Proposed Regulation, WEF 9th Annual Industrial Wastes Technical and Regulatory Conference, San Antonio, TX, April 14, 2003.

Reducing The Cost And Area Footprint Of Activated Sludge Treatment Using Integral Secondary Clarification, BAT Seminar, Vanderbilt University, Nashville, TN, February 26, 2003.

Reducing the Cost and Area Footprint of Activated Sludge Treatment Using Integral Secondary Clarification, Innovation 2000, Cambridge University, Churchill College UK, July 7-10, 1998.

Wastewater Operator Recertification Training Program, Instructor for Kentucky Division of Water Certification, Olin Chemicals, Brandenburg, KY April 9-11, 1997.

Source Control WWTP Operational Impact, American Institute of Chemical Engineers, Spring National Meeting, Houston TX, March , 1997.

Rapid Evaluation and Installation of a Low Cost Water Treatment Scheme at a Superfund Site, with Anu Singh and Pat Campbell, Industrial Waste Technical Conference, Water Environment Federation. New Orleans, LA March 1997.

Optimizing Design for Secondary Clarifiers, Water Environment Federation. Anaheim, CA, October 1993.

Methods for Upgrading and Retrofitting Industrial Activated Sludge Plants: An Overview, Industrial Waste Conference, Purdue University, West Lafayette, IN, May 1990.

Technical Aspects of Combined Wastewater Treatment, Presented at the Treatment of Combined (Urban and Industrial) Wastewater International Environmental Engineers meeting, Liege, Belgium, May 1978.

What's Ahead for Best Available Treatment EPA Requirements, Pulp Chemicals Association, Savannah, April 1978.

Operational Optimization of a 36-mad Activated Sludge Facility at Winston-Salem, North Carolina to Meet Water Quality Standards, with C.D. Malign, R.M. Stein, P. Swann, T. Cornett, and Dan Foster. 50th Water Pollution Control Federation Annual Conference, Philadelphia, October 1977.

New Developments in Industrial Wastewater Treatment in the United States, with W.W. Eckenfelder, Jr. Presented at the Annual Conference of the Israel Ecological Society, Haifa, Israel, May 1977.

Cost-effective Operations, Logistics and Optimization of a Multi-Industrial Regional Activated Sludge Treatment Facility, WWEMA Industrial Pollution Conference, Atlanta, April 1977.

Overview of Wastewater Management in the Pulp and Paper Industry in the United States, Design of Wastewater Treatment Plants, Economic Reuse in Biological and Physical Chemical Processes, International Symposium on Industrial Waste and Environment, Caracas, Venezuela, November 1976.

Design and Process Concepts Utilizing Flotation, Aeration, and Clarification, Infilco Degremont Field Sales Meeting, Buford, GA, July 1976.

Permit Amending for Best Practical Treatment for 1977 and What's Ahead for Best Available Treatment in 1983, Pulp Chemicals Association Joint Committee Meetings: Technical, Environmental, and Chemicals, Charleston, SC, March 1975.

Permit Amending for Best Practical Treatment, Pulp Chemicals Association Joint Meeting of Technical, Environmental, and Chemical Recovery Committee, Charleston, SC, October 1975.

Biological Treatment, IAWPR Workshop on Design and Operation Interactions at Large Treatment Plants, Vienna, Austria, September 1975.

Methodology for Evaluating Toxicity or Inhibition to Biological Systems, International Association for Water Pollution Research, Birmingham, England, U.K., April 1974.

Ion Exchange and Air Flotation, IAWPR Continuing Education Meeting, sponsored by the International Association for Water Pollution Research, Birmingham, England, U.K., September 1974.

Physical-Chemical and Biological Treatment Alternatives for a Tall Oil Plant Effluent, Annual ACS Meeting, New Orleans, 1973.

In-Plant Modifications for Reduction of Nitrogenous Pollutional Input to Fertilizer Plant Effluent, with E. Bingham and P. Krenkel, presented at the 63rd Annual Meeting of the AIChE, Chicago, November-December 1970.

Literature and Laboratory Investigations into the Removal and Recovery of High Concentrations of Nitrogen, with P. Krenkel and W.W. Eckenfelder Jr., International Congress on Industrial Wastewater, Stockholm, Sweden, November 1970.

BOOKS

Nitrification/Denitrification Handbook, for the Chemical Industry Environmental Technology Projects, LLC, September, 1999.

Development of Design and Operational Criteria for Wastewater Treatment, C.E. Adams, Jr. and W.W. Eckenfelder, Jr., Enviro Press, Nashville TN, 1981..

Process Design Techniques for Industrial Waste Treatment, edited by C.E. Adams, Jr. and W.W. Eckenfelder, Jr., Enviro Press, Nashville, 1974.

Handbook for Monitoring Industrial Wastewater, prepared by AWARE, Inc. for U.S. EPA Technology Transfer Div., August 1973.

SEMINARS/LECTURES (WITHIN THE UNITED STATES)

The ADVENT Integral System, Pfizer Environmental Engineering Seminar, Boston, MA, October 26, 2000.

Environmental and Energy Infrastructure Opportunities Seminar : A Case Study, East Tennessee Environmental Business Association, Oak Ridge, TN May 1999.

Environmental and Energy Infrastructure Opportunities Seminar : A Case Study, American-Israel Chamber of Commerce, Atlanta, GA February 1999.

Planning for Industrial Wastewater Management – Source Control, Water Quality Management for Industrial Facilities in the Great Lakes Region, with Sonnenschein Nath & Rosenthal, Chicago, IL June 1998.

Wastewater Operator Recertification Training Program, Instructor, Kentucky Division of Water Operator Certification, Olin Chemicals, Brandenburg, KY April 1998.

A Cost Effective, Innovative Approach to the Activated Sludge Process, National Meeting of the American Institute of Chemical Engineers, New Orleans, LA, March 1998.

API Separator Maintenance and Operational Considerations, Petroleum Environmental Research Forum, Houston, TX October 1997.

Wastewater Operator Recertification Training Program, Instructor, Kentucky Division of Water Operator Certification, Olin Chemicals, Brandenburg, KY April 1997.

Source Control WWTP Operational Impact, American Institute of Chemical Engineers, 1997 Spring National Meeting, Houston TX, March 1997.

Wastewater Operator Recertification Training Program, Instructor, Kentucky Division of Water Operator Certification, Olin Chemicals, Brandenburg, KY April 1996.

Master Planning for Industrial Wastewater Management, Water Quality Management for Industrial Facilities, Charleston, WV, March 1995.

Wastewater Operator Recertification Training Program, Olin Chemicals. Instructor, Kentucky Division of Water Operator Certification, Brandenburg, KY April 1995.

New Innovation for Biological Treatment of Industrial Wastewater and Groundwaters, EnviroExpo 94, Charlotte, NC, October 1994.

Environmental Wastewater/Groundwater Master Planning for Industry, EnviroExpo 94, Charlotte, NC, October 1994.

Wastewater Operator Recertification Training Program, Olin Chemicals. Instructor, Kentucky Division of Water Operator Certification, Brandenburg, KY, April 1994.

Wastewater Operator Recertification Training Program, Olin Chemicals. Instructor, Kentucky Division of Water Operator Certification, Brandenburg, KY, March 1993.

The Clean Water Act, Environmental Laws for Industries, Lake Area Industries/McNeese Engineering Partnership, McNeese State University Campus, Lake Charles, LA, September 1992.

Biological Wastewater Treatment, Seminar sponsored by Auburn University, Birmingham, August 1981.

Wastewater Engineering, Seminar presented by Vanderbilt University to Union Carbide, Charleston, WV, August 1981.

Operation, Control and Management of Activated Sludge Plants Treating Industrial Wastewaters, Seminar sponsored by Vanderbilt University, Tampa, July 1981.

Wastewater Engineering, Seminar sponsored by Vanderbilt University, May 1981.

Development of Design Criteria for Wastewater Treatment Process, Seminar sponsored by Vanderbilt University, April - May 1981.

Control, Operation and Management of Biological Wastewater Treatment Plants, Seminar sponsored by Vanderbilt University, Nashville, October 1980.

Operation and Management of Activated Sludge Plants, Seminar sponsored by The AWARE Corporation in conjunction with Sage Murphy and Associates, Inc., Denver, September 1980.

Process Design in Water Quality Engineering, Seminar sponsored by Vanderbilt University, Boston, August 1980.

Operation, Control and Management of Activated Sludge Plants Treating Industrial Wastewaters Seminar sponsored by Vanderbilt University, Boston, August 1980.

Operation and Maintenance, Seminar sponsored by AAWPC, Montgomery, July 1980.

Operation, Control, and Management of Activated Sludge Plants, Seminar sponsored by Vanderbilt University, Nashville, June-July 1980.

Development of Design Criteria for Wastewater Treatment Processes, Seminar sponsored by Vanderbilt University, Nashville, April 1980.

Pretreatment of Industrial Wastewaters, Seminar sponsored by Vanderbilt University, Chicago, March 1980.

Operation, Control, and Management of Activated Sludge Plants, Seminar sponsored by Vanderbilt University, Tampa, January 1980.

Principles of Biological Wastewater Treatment for Industrial and Municipal Applications, with W.W. Eckenfelder, Jr. Seminar sponsored by Auburn Engineering Extension Service, Auburn University, Birmingham, January 1980.

Industrial Wastewater Pretreatment for Discharge to Municipal Systems, Seminar sponsored by Vanderbilt University, Nashville, December 1979.

Analytical Considerations, Technical Preparation for Negotiating and Amending NPDES Permits, Case Histories: Legal and Regulatory Implications of Compliance and Non-compliance with NPDES Permits. Seminar sponsored by Auburn University Engineering Extension Service, and Construction Advancement Program of Alabama, Birmingham, November 1979.

Biological Treatment Process: Aerated Lagoons, Advanced Waste Treatment: Biological Removal of Nitrogen; Ammonia Stripping, Membrane Processes, Process Design in Water Quality Engineering: New Concepts and Developments. Seminar sponsored by Vanderbilt University School of Engineering Continuing Education, Environmental and Water Resources Engineering Program, Nashville, October 1979.

Performance Monitoring, Nitrification and Denitrification, Biological Sludge Handling: Operation, Control and Management of Activated Sludge Plants Treating Industrial Wastewaters, Seminar sponsored by Vanderbilt School of Engineering, Continuing Education, Environmental and Water Resources Engineering Program, Philadelphia, October 1979.

Performance Monitoring, Nitrification and Denitrification, Operating Conditions for Nitrification and Denitrification, Variables Affecting Nitrification Performance, Operating Mode to Enhance Nitrification: Control, Operation and Management of Biological Wastewater Treatment Plants. Seminar sponsored by Vanderbilt University School of Engineering Continuing Education, Environmental and Water Resources Engineering Program, Nashville, September 1979.

Operation and Management of Biological Wastewater Treatment Plants, with W.W. Eckenfelder, Jr. Short course sponsored by Auburn University Engineering Extension Service and Construction Advancement Program of Alabama, Birmingham, August 1979.

“Operation and Management of Biological Wastewater Treatment Plants,” with W.W. Eckenfelder, Jr. Short course sponsored by Auburn University Engineering Extension, Birmingham, June 1979.

Biological Treatment: Biological Removal of Nitrogen and Phosphorus, and Sludge Handling Conditioning, Gravity Thickening, Centrifugation, Vacuum Filtration, Pressure Filtration, and Aerobic Digestion, Management of Refining and Petrochemical Wastewaters, Seminar sponsored by the University of Tulsa Continuing Education Division, College of Engineering and Physical Sciences, Tulsa, OK June 1979.

Performance Monitoring and Nitrification and Denitrification: Operation, Control and Management of Activated Sludge Plants Treating Industrial Wastewaters, Seminar sponsored by Vanderbilt University School of Engineering, Dept of EWRE, New York, May 1979.

“Upgrading of Activated Sludge Systems,” with W.W. Eckenfelder, Jr. Presented for MIXCO, Rochester, NY, May 1979.

Performance Monitoring and Nitrification: Operation, Control and Management of Activated Sludge Plants Treating Industrial Wastewaters, Seminar sponsored by Vanderbilt University School of Engineering, Dept. of EWRE, San Francisco, April 1979.

Methodology for the Determination of Toxic or Inhibitory Effects, Pretreatment Procedures, Continuous Treatment Studies: Aerated Lagoons, and Biological Sludge Handling Procedures: Aerobic Digestion, Dissolved Air Flotation, Gravity Thickening, Thermal Content. Development of Design Criteria for Wastewater Treatment Processes, Seminar sponsored by Vanderbilt University School of Engineering, Dept. of EWRE, Nashville, April 1979.

Upgrading of Activated Sludge Systems, with W.W. Eckenfelder, Jr. Presented for MIXCO, Denver, April 1979.

Performance Monitoring and Nitrification: Operation, Control and Management of Activated Sludge Plants Treating Industrial Wastewaters, Seminar sponsored by Vanderbilt University School of Engineering, Dept. of EWRE, Chicago, March 1979.

Operation of Activated Sludge System, with W.W. Eckenfelder, Jr. Presented for MIXCO, Boston, March 1979.

Performance Monitoring and Nitrification-Denitrification: Operation, Control and Management of Activated Sludge Plants Treating Industrial Wastewaters, Seminar sponsored by Vanderbilt University School of Engineering, Dept EWRE, Houston, February 1979.

Aerated Lagoon Modifications: Upgrading of Wastewater Treatment Plants, Seminar sponsored by Vanderbilt University School of Engineering, Dept EWRE, Nashville, February 1979.

Principles of Biological Wastewater Treatment for Industrial and Municipal Applications, with W.W. Eckenfelder, Jr. Seminar sponsored by Auburn University Engineering Extension Service and Construction Advancement Program of Alabama, Birmingham, January - February 1979.

Technical Preparation for Negotiating and Amending NPDES Permits: Legal and Regulatory Implications of Compliance and Non-Compliance with NPDES Permits, Short course sponsored by Auburn University, Birmingham, November 1978.

Biological Removal of Nitrogen: Processes for Wastewater Reclamation and Reuse, Short Course, sponsored by University of California, Berkeley, October 1978.

Advanced Wastewater Treatment, Short course with W.W. Eckenfelder, Jr. Sponsored by Auburn University, Birmingham, August 1978.

Aerated Lagoon Modifications: Redesign for Nitrification/Denitrification and Upgrading of Wastewater Treatment Plants, Seminar sponsored by Vanderbilt University, Center for Environmental Quality Management, Vanderbilt University, Nashville, August 1978.

Control, Operation and Management of Biological Wastewater Treatment Plants Seminar, with W.W. Eckenfelder, Jr., A.W. Edwards, C.D. Malone, and K.C. Mills. Sponsored by Vanderbilt University and AWARE, Inc. for the Commonwealth of Kentucky, Frankfort, KY, May 1978.

Technical Preparation for Negotiating and Amending NPDES Permits: Legal and Regulatory Implications of Compliance and Non-Compliance with NPDES Permits. Short course sponsored by Auburn University, Birmingham, March 1978.

Principles of Biological Wastewater Treatment for Industrial and Municipal Applications, with W.W. Eckenfelder, Jr. Seminar sponsored by Auburn Engineering Extension Service, Auburn University, Birmingham, January - February 1978.

Practical Aspects of Wastewater Management, with W.W. Eckenfelder, Jr., J.H. Koon, and R.M. Stein. Seminary presented by AWARE, Inc. for Virginia Chemicals, Inc., Portsmouth, VA, January 1978.

Technical Preparation for Negotiating and Amending NPDES Permits, Legal and Regulatory Implications of Compliance and Non-compliance with NPDES Permits. Short Course sponsored by Auburn University, Birmingham, November 1977.

Biological Treatment Processes, Advanced Waste Treatment: Nitrogen Removal, Ammonia Stripping, Membrane Process, Process Design Considerations for Treatment of Industrial Wastewater. Sponsored by Vanderbilt University, Dept of EWRE, Continuing Education Division, Nashville, November 1977.

Wastewater Treatment Plant Operations Training Program. Seminar presented by AWARE, Inc. for U.S. Navy, Washington, D.C., November 1977.

Coal Waste Technology Seminar, with W.W. Eckenfelder, Jr., J.H. Koon, F.G., Ziegler, G.M. David, N.E. Olaya and A. Ramirez. Presented by AWARE, Inc. Nashville, TN for Gulf Coast Waste Disposal Authority, Houston, November 1977.

Pretreatment of Industrial Wastewaters for Discharge into Municipal Systems, with W.W. Eckenfelder, Jr., J.H. Koon, and R.M. Stein. Seminar sponsored by AWARE, Inc., Philadelphia, October 1977.

Sudge Handling Facilities, Performance Monitoring, Nitrification-Denitrification Process, Control, Operation and Management of Biological Wastewater Treatment Plants. Seminar sponsored by Vanderbilt University, Nashville, September 1977.

Advanced Wastewater Treatment, with W.W. Eckenfelder, Jr. Short Course sponsored by Auburn University, Engineering Extension Division, Birmingham, August-September 1977.

Technical Preparation for Negotiating and Amending NPDES Permits, Legal and Regulatory Implications of Compliance and Non-Compliance with NPDES Permits, Short Course sponsored by Auburn University, Birmingham, June 1977.

Environmental Management Seminar, with W.W. Eckenfelder, Jr., J.H. Koon, R.M. Stein, and F.G. Ziegler. Presented by AWARE, Inc., Nashville, TN for FMC Corporation, Fredricksburg, VA March 1977.

New Technology and Trends in Wastewater Treatment, with W.W. Eckenfelder, Jr. Seminar presented for Proctor and Gamble Company by AWARE, Inc., Cincinnati, March 1977.

Methodology for the Determination of Toxic or Inhibitory Effects, Pretreatment Procedures, Continuous Treatment Studies: Aerated Lagoons,” and “Biological Sludge Handling Procedures: Aerobic Digestion, Dissolved Air Flotation, Gravity Thickening, Thermal Content. Development of Design Criteria for Wastewater Treatment Processes. Seminar sponsored by Vanderbilt University School of Engineering, Department of EWRE, Nashville, March 1977.

Principles of Biological Wastewater Treatment for Industrial Municipal Applications, with W.W. Eckenfelder, Jr. Seminar sponsored by Auburn Engineering Extension Service, Auburn University, Birmingham, February 1977.

Biological Treatment Processes: Aerated Lagoons, Advanced Waste Treatment: Biological Removal of Nitrogen; Ammonia Stripping, Membrane Processes, Process Design in Water Quality Engineering: New Concepts and Developments. Seminar sponsored by Vanderbilt University School of Engineering Continuing Education, Environmental and Water Resources Engineering Program, Nashville, November 1976.

Pretreatment of Industrial Wastewaters for Discharge into Municipal Systems, with W.W. Eckenfelder, Jr., J.H. Koon, and R.M. Stein. Seminar presented by AWARE, Inc., Minneapolis, October 1976.

Water Quality Engineering, with W.W. Eckenfelder, Jr. Short course sponsored by Auburn University Engineering Extension Division, Birmingham, August 1976.

Methodology for Determination of Toxic or Inhibitory Effects, Pretreatment Procedures, Computer Design in Activated Sludge, Continuous Treatment Studies: Aerated Lagoons, Biological Sludge Handling Procedures, Coagulation, Ozonation, The Development of Design Criteria for Wastewater Treatment Processes. Seminar sponsored by Vanderbilt University, School of Engineering, Department of Engineering, Department of EWRE, Continuing Education, Nashville, March-April 1976.

Design and Operation of Wastewater Treatment Processes-Pulp and Paper Industry, with W.W. Eckenfelder, R.M. Stein, and J.H. Koon. Seminary presented by AWARE, Inc., Atlanta, April 1976.

Process Design of Industrial Wastewater Treatment, with J.H. Koon, W.W. Eckenfelder, Jr., and R.M. Stein. Seminar presented by AWARE, Inc., Miami, October 1975.

Optimization of Activated Sludge Plant Operation for Industrial Wastewater, with J.H. Koon, W.W. Eckenfelder, Jr., and R.M. Stein. Seminar presented by AWARE, Inc., Miami, October 1975.

Wastewater Treatment Technology Seminar, with W.W. Eckenfelder, Jr. and J.H. Koon. Presented by AWARE, Inc. for Economic Analysis Div., Office of Planning and Evaluation, EPA, Washington, D.C. July 1975.

Pretreatment of Industrial Wastewaters for Discharge into Municipal Sewers, with W.W. Eckenfelder, Jr., J.H. Koon, and R.M. Stein. Seminary presented by AWARE, Inc., Chattanooga, June 1975.

Pretreatment of Industrial Wastewaters for Discharge into Municipal Sewers, with W.W. Eckenfelder, Jr., J.H. Koon, and R.M. Stein. Seminary presented by AWARE, Inc., Saddlebrook, NJ, June 1975.

Biological Treatment Processes: Aerated Lagoons, Advanced Waste Treatment: Biological Removal of Nitrogen; Ammonia Stripping, Membrane Processes, Process Design in Water Quality Engineering: New Concepts and Developments. Seminar sponsored by Environmental and Water Resources Engineering and the Environmental Associates Program, Vanderbilt University School of Engineering, Nashville, April 1975.

Pretreatment of Industrial Wastewaters for Discharge into Municipal Sewers, with W.W. Eckenfelder, Jr., J.H. Koon, and R.M. Stein. Seminary presented by AWARE, Inc., Houston, November 1974

Wastewater Treatment Technology Seminar, with W.W. Eckenfelder, Jr. Seminar presented to Environmental Protection Agency, Washington, D.C., October-November 1974.

Pretreatment of Industrial Wastewaters for Discharge into Municipal Sewers, with W.W. Eckenfelder, Jr., J.H. Koon, and R.M. Stein. Seminary presented by AWARE, Inc., Denver, October 1974.

Biological Wastewater Treatment, with W.W. Eckenfelder, Jr. and G.L. Shell. Seminar presented by AWARE, Inc. for The Proctor and Gamble Company, Cincinnati, September 1974.

Process Design Techniques for Industrial Wastewater Treatment, with W.W. Eckenfelder, Jr., J.H. Koon, and R.M. Stein. Seminar Presented by AWARE, Inc., Chicago, June 1974.

Pretreatment of Industrial Wastewaters for Discharge into Municipal Sewers, with W.W. Eckenfelder, Jr., J.H. Koon, and R.M. Stein. Seminary presented by AWARE, Inc., Chicago, June 1974.

Process Design Techniques for Industrial Wastewater Treatment, with W.W. Eckenfelder, Jr., J.H. Koon, and R.M. Stein. Seminar Presented by AWARE, Inc., San Francisco, April 1974.

Process Design Techniques for Industrial Wastewater Treatment, with W.W. Eckenfelder, Jr., J.H. Koon, and R.M. Stein. Seminar Presented by AWARE, Inc., New York, March 1974.

Pretreatment of Industrial Wastewaters for Discharge into Municipal Sewers, with W.W. Eckenfelder, Jr., J.H. Koon, and R.M. Stein. Seminary presented by AWARE, Inc., Atlanta, January 1974.

Pretreatment of Industrial Wastewaters for Discharge into Municipal Sewers, with W.W. Eckenfelder, Jr., J.H. Koon, and R.M. Stein. Seminary presented by AWARE, Inc., New York, March 1974.

Pretreatment of Industrial Wastewaters for Discharge into Municipal Sewers, with W.W. Eckenfelder, Jr., J.H. Koon, and R.M. Stein. Seminary presented by AWARE, Inc., San Francisco, April 1974.

Process Design Techniques for Industrial Wastewater Treatment, with W.W. Eckenfelder, Jr., J.H. Koon, and R.M. Stein. Seminar Presented by AWARE, Inc., Atlanta, January 1974.

“Multi-Stage Aerated Lagoon Design for a High Temperature Wastestream,” *Proc. of 19th Environmental and Water Resources Engineering Conf.*, Vanderbilt University, Nashville, June 1971.

SEMINARS/LECTURES (OUTSIDE THE UNITED STATES)

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